AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the captioned patent application:

Listing of Claims:

1. (Currently Amended) ~~A power management system for supplying power to an~~ An implantable medical device, comprising:

an output circuit;

a power management system configured to supply power to the output circuit comprising:

a plurality of rechargeable batteries;

first conversion means for converting a supply voltage to a battery voltage; ~~voltage to enable charging of one or more of the plurality of rechargeable batteries; and~~

switch means to ~~enable~~ selectively connect ~~a selected battery of~~ the plurality of rechargeable batteries ~~to be connected~~ to the first conversion means for charging of the batteries and to connect a selected one or more of the plurality of batteries to the output circuit to enable the selected one or more batteries ~~battery~~ to be discharged through the output ~~circuit,~~ circuit. ~~wherein the output circuit forms part of an implantable device.~~

2. (Cancelled)

3. (Currently Amended) The ~~system according to claim 1~~ the device of claim 1, wherein the power management system further ~~comprising~~ comprises:

a second conversion means connected between the output circuit and the switch means for converting the voltage of the selected one or more batteries ~~battery~~ to a voltage for use by the output circuit thereby discharging the selected one or more batteries ~~battery~~.

4. (Currently Amended) The ~~system according to claim 1~~ the device of claim 1, wherein the plurality of rechargeable batteries are charged or discharged ~~a rechargeable battery of the plurality of rechargeable batteries is chosen,~~ one at a time~~, in order to be charged or discharged~~.

5. (Currently Amended) The ~~system according to claim 1~~ the device of claim 1, wherein the first conversion means is also connected between the output circuit and the switch means for converting the voltage of the selected one or more batteries to a voltage for use by the output circuit.
~~acts as the second conversion means.~~

6. (Currently Amended) The ~~system according to claim 1~~ the device of claim 1, wherein the switch means comprises a plurality of switches enabling connection of ~~a respective~~ one or more ~~rechargeable battery~~ of the plurality of rechargeable batteries to the first conversion means and of the selected one or more batteries to the output circuit.

7. (Currently Amended) The ~~system according to claim 1~~ the device of claim 1, further ~~comprising~~ a comprising:

a control unit ~~for controlling~~ configured to control the switch means to either enable the charging of the plurality of batteries and the discharging of the selected one or more batteries based on the state of charge of the plurality of batteries. ~~charging or discharging of a rechargeable battery of the plurality of rechargeable batteries.~~

8. (Currently Amended) The ~~system according to claim 7~~ device of claim 1, wherein the power management system further ~~comprising~~ comprises a multiplexer means having an input connected to one terminal of each ~~rechargeable battery in the~~ of the plurality of rechargeable batteries to enable the voltage signals pertaining to each battery to be selected and forwarded to an ~~analogue~~ analog to digital converter.

9. (Currently Amended) The ~~system according to claim 8~~ device of claim 8, wherein the power management system further ~~comprising~~ comprises a shunt impedance means connected to ~~the other~~ a second terminal of each ~~battery in the~~ of the plurality of rechargeable batteries to measure the charge current of each battery, represented as a voltage drop across the shunt impedance means.

10. (Currently Amended) The ~~system according to claim 9~~ device of claim 9, wherein the shunt impedance means is connected in parallel to a shunt switch to short circuit the shunt impedance means when the shunt impedance is not in use.

11. (Currently Amended) The ~~system according to claim 10~~ device of claim 10, wherein the power management system further ~~comprising~~ comprises an amplification means connected between the shunt impedance means and the multiplexer means to amplify the voltage drop across the shunt impedance means to the input voltage range of the ~~analogue~~ analog to digital converter.

12-13. (Cancelled)

14. (Currently Amended) The ~~system according to claim 10~~ device of claim 10, wherein the power management system further ~~comprising~~ comprises a register for storing information pertaining to each battery.

15. (Currently Amended) The ~~system according to claim 14~~ device of claim 14, wherein said information comprises any one or more of charge status of each battery in the plurality of rechargeable batteries, error status of each battery in the plurality of rechargeable batteries or a flag identifying whether a battery in the plurality of rechargeable batteries has been disabled from being charged or discharged.

16-18. (Cancelled)

19. (Currently Amended) The ~~system according to claim 1~~ the device of claim 3, wherein the second conversion means enables discharging of ~~a battery of the plurality of rechargeable batteries~~ the selected one or more batteries such that charge in the ~~selected battery of the plurality of rechargeable batteries~~ selected one or more batteries is forwarded to the output circuit.

20. (Cancelled)

21. (Currently Amended) The ~~system according to claim 1,~~ the device of claim 1, wherein the implantable device is an implantable hearing prosthesis.

22. (Currently Amended) The ~~system according to claim 1~~ the device of claim 1, wherein the first conversion means includes an inductive means, one or more switches and a switch control unit to enable charging ~~and/or discharging of a selected battery~~ of the plurality of rechargeable batteries.

23. (Currently Amended) The ~~system according to claim 1~~ the device of claim 3, wherein the second conversion means includes an inductive means, one or more switches and a switch control unit to enable discharging of ~~a selected battery of the plurality of rechargeable batteries.~~ the selected one or more batteries.

24. (Cancelled)

25. (Currently Amended) A method of managing the supply of power to an output circuit ~~in a system that includes~~ of an implantable medical device comprising a plurality of rechargeable batteries, the method comprising the steps of:

converting, with a an input voltage converter circuit, a supply voltage to a battery ~~voltage~~ voltage; ~~to enable charging of one or more of the plurality of the rechargeable batteries; and~~

selectively connecting, using switch means, the plurality of rechargeable batteries to the input voltage converter circuit to charge the plurality of batteries;

connecting ~~a battery in the~~ a selected one or more of the plurality of rechargeable batteries, using the switch ~~switch~~ means, to the output circuit to enable the ~~connected~~ selected one or more batteries ~~battery~~ to be discharged through the output ~~circuit~~ circuit. ~~wherein the output circuit forms part of an implantable device.~~

26. (Currently Amended) The method ~~according to claim 25~~ of claim 25, wherein the ~~connected~~ selected one or more batteries are ~~battery in the plurality of rechargeable batteries is~~ discharged to the output circuit by converting the voltage output from the ~~connected~~ selected one or more batteries ~~battery in the plurality of rechargeable batteries~~ to a voltage for use by the output circuit.

27. (Currently Amended) The method ~~according to claim 25~~ of claim 25, further comprising the ~~step of~~ step of:

providing the switch means in the form of a bank of switches, one for each rechargeable battery of the plurality of rechargeable batteries.

28. (Currently Amended) The method ~~according to claim 27~~ of claim 25, further comprising the ~~step of~~ step of:

controlling the switch means to enable the ~~charging or discharging of a selected battery of the plurality of rechargeable batteries on the basis of~~ charging of the plurality of batteries and the discharging of the selected one or more batteries based on information on each of the rechargeable batteries stored in a register ~~on each of the rechargeable batteries in the plurality of rechargeable batteries~~.

29. (Currently Amended) The method ~~according to claim 28~~ of claim 28, further comprising the ~~steps of~~ steps of:

multiplexing and measuring parameters, such as battery voltage, battery charge and battery current, pertaining to each ~~rechargeable battery in the plurality of~~ of the rechargeable batteries for storage as digital values in the register.

30. (Currently Amended) The method ~~according to claim 29~~ of claim 29, further comprising the ~~step of~~ step of:

maintaining a record in the register on the state of charge of each ~~rechargeable battery in the plurality of~~ of the rechargeable batteries.

31. (Currently Amended) The method ~~according to claim 30~~ of claim 30, further comprising the ~~step of~~ step of:

providing an optimum range, as a percentage value of the state of charge, within which each rechargeable battery ~~in the plurality of rechargeable batteries~~ is charged and/or discharged.

32. (Currently Amended) The method ~~according to claim 31~~ of claim 31, further comprising the ~~step of~~ step of:

disabling charging of a battery of the plurality of rechargeable batteries where the charge of ~~that battery of the plurality of rechargeable batteries~~ the battery is above a first percentage limit of the state of charge.

33. (Currently Amended) The method ~~according to claim 31~~ of claim 31, further comprising the ~~step of~~ step of:

terminating the discharging of a battery of the plurality of rechargeable batteries where the charge of ~~that battery of the plurality of rechargeable batteries~~ the battery is below a second percentage limit of the state of charge.

34. (Currently Amended) ~~A power management system for supplying power to an~~ An implantable medical device, comprising:

an output circuit;

a power management system configured to supply power to the output circuit comprising:

a plurality of rechargeable batteries;

an input voltage converter circuit configured to convert a supply voltage to a battery voltage; ~~voltage to enable charging of one or more of the plurality of rechargeable batteries; and~~

a switch matrix configured to ~~enable~~ selectively connect ~~a selected battery of~~ the plurality of ~~echargeable~~ rechargeable batteries ~~to be connected~~ to the input voltage converter circuit for charging of the batteries and to connect a selected one or more of the plurality of batteries to the output circuit to enable the selected ~~battery~~ one or more batteries to be discharged through the output ~~circuit,~~ circuit. ~~wherein the output circuit forms part of an implantable device.~~

35. (Cancelled)

36. (Currently Amended) The ~~system~~ device of claim 34, ~~further comprising:~~ wherein power management system further comprises:

an output voltage converter circuit connecting the output circuit and the switch matrix and configured to convert the voltage of the selected ~~battery~~ one or more batteries to a voltage for use by the output circuit, thereby discharging the selected one or more batteries ~~battery~~.

37. (Currently Amended) The ~~system~~ device of claim 34, wherein ~~a rechargeable battery of~~ the plurality of rechargeable batteries are charged or discharged ~~is chosen,~~ one at a time~~, in order to be charged or discharged~~.

38. (Currently Amended) The ~~system~~ device of claim 34, wherein the input voltage converter circuit ~~functions as the output voltage converter circuit.~~ is also connected between the output circuit and the switch matrix for converting the voltage of the selected one or more batteries to a voltage for use by the output circuit.

39. (Currently Amended) The ~~system~~ device of claim 34, wherein the switch matrix comprises a plurality of switches enabling connection of ~~a respective~~ one or more of the ~~rechargeable battery~~ rechargeable batteries to the input voltage converter circuit and of the selected one or more batteries to the output circuit.

40. (Currently Amended) The ~~system~~ device of claim 34, further comprising:

a control unit configured to control the switch matrix to either enable the charging of the plurality of batteries and the discharging of the selected one or more batteries based on the state of charge of the plurality of batteries. ~~charging or discharging of a rechargeable battery of the plurality of rechargeable batteries.~~

41. (Currently Amended) The ~~system~~ device of claim 40, ~~further comprising:~~ wherein the power management system further comprises:

a multiplexer having an input connected to one terminal of each rechargeable battery ~~in the plurality of rechargeable batteries~~ to enable the voltage signals pertaining to each battery to be selected and forwarded to an ~~analogue~~ analog to digital converter.

42. (Currently Amended) The ~~system~~ device of claim 41, ~~further comprising:~~ wherein the power management system further comprises:

a shunt resistor connected to ~~the other~~ a second terminal of each ~~battery in the~~ of the plurality of rechargeable batteries to measure the charge current of each battery, represented as a voltage drop across the resistor.

43. (Currently Amended) The ~~system~~ device of claim 42, wherein the shunt resistor is connected in parallel to a shunt switch to short circuit the resistor when the resistor is not in use.

44. (Currently Amended) The ~~system~~ device of claim 43, ~~further comprising:~~ wherein the power management system further comprises:

an amplifier connected between the shunt resistor and the multiplexer to amplify the voltage drop across the resistor to the input voltage range of the ~~analogue~~ analog to digital converter.

45. (Currently Amended) The ~~system~~ device of claim 44, wherein the ~~analogue~~ analog to digital converter measures individual battery voltage of any one of the rechargeable batteries ~~in the plurality of rechargeable batteries~~ and converts the measured voltage to a digital value.

46. (Currently Amended) The ~~system~~ device of claim 44, wherein the ~~analogue~~ analog to digital converter measures the voltage drop across the shunt resistor and converts the measured voltage into a digital value.

47. (Currently Amended) The ~~system~~ device of claim 46, further comprising:

a register for storing information pertaining to each battery.

48. (Currently Amended) The ~~system~~ device of claim 47, wherein said information comprises any one or more of charge status of each battery in the plurality of rechargeable batteries, error status of each battery in the plurality of rechargeable batteries or a flag identifying whether a battery in the plurality of rechargeable batteries has been disabled from being charged or discharged.

49. (Currently Amended) The ~~system~~ device of claim 48, wherein the control unit is in communication with the register and with the ~~analogue~~ analog to digital converter for processing signals and data from the ~~analogue~~ analog to digital converter and from the register.

50. (Currently Amended) The ~~system~~ device of claim 49, wherein the control unit periodically senses the presence of a voltage at the input to the switch matrix.

51. (Currently Amended) The ~~system~~ device of claim 50, wherein the control unit selects a battery of the plurality of rechargeable batteries to be charged or discharged on the basis of information stored in the register ~~pertaining to a particular battery of the plurality of rechargeable batteries~~.

52. (Currently Amended) The ~~system~~ device of claim 34, wherein the implantable device is an implantable hearing prosthesis.

53. (Currently Amended) The ~~system~~ device of claim 34, wherein the input voltage converter circuit includes an inductor, one or more switches and a switch control unit to enable charging ~~and/or discharging of a selected battery~~ of the plurality of rechargeable batteries.

54. (Currently Amended) The ~~system~~ device of ~~claim 34~~ claim 36, wherein the output voltage converter circuit includes an inductor, one or more switches and a switch control unit to enable discharging of ~~a selected battery of the plurality of rechargeable batteries.~~ the selected battery.